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GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF RESEARCH ADMINISTRATION

RESEARCH PROJECT INITIATION

Date: November 19, 1973

Project Title: Cost Accounting System - Phase I

Project No: E-24-623

Principal Investigator Dr. K. M. Bafna

Sponsor: 1973 Fulton County $25,000 Grant

Agreement Period: From 1/1/73 Until 12/31/73

Type Agreement: Contract dated June 6, 1973

Amount: $2,380

Reports Required: As applicable

Sponsor Contact Person (s):

Mr. Edward T. Hogan
Office of the County Manager
Room 401
165 Central Avenue, S.W.
Atlanta, Georgia 30303
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Assigned to: School of Industrial & Systems Engineering

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RA-3 (6-71)

GEORGIA INSTITUTE OF TECHNOLOGY

OFFICE OF RESEARCH ADMINISTRATION

RESEARCH PROJECT TERMINATION

Date: 17 July 1974

Project Title "Cost Accounting System - Phase I"

Project No: E-24-623

Principal Investigator: Dr. K. M. Bafna

Sponsor: 1973 Fulton County $25,000 Grant

Effective Termination Date: 6-27-74 (Final Report submitted)

Clearance of Accounting Charges: ASAP

Grant/Contract Closeout Actions Remaining: None.

Assigned to School of Industrial and Systems Engineering

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Office of Financial Affairs (2)	Other
Security - Reports - Property Office	
Patent and Inventions Coordinator	

RA-4 (5/70)

SCHOOL OF INDUSTRIAL AND SYSTEMS ENGINEERING

GEORGIA INSTITUTE
OF TECHNOLOGY
ATLANTA, GEORGIA 30332

A FEASIBILITY REPORT

for

A COST ACCOUNTING SYSTEM

in the

PUBLIC WORKS DEPARTMENT, FULTON COUNTY

Submitted by

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Assistant Professor
School of Industrial and Systems Engineering
Georgia Tech
Atlanta, Georgia 30332

This research was performed under a grant made available by Fulton County.

CONTENTS

Introduction

Almost every citizen has a valid interest in the efficient operation of governmental units, not only because as a taxpayer he supports them, but also because of the very considerable involvement of governmental units at all levels in the lives of the citizens. One of the principal methods of evaluating the performance of a governmental unit, which is usually a non-profit organization, is to measure the achievements against the money spent for attaining these achievements. Hence the accounting function plays a very important role.

Need for a Cost Accounting System

Whenever the feasibility of any system is studied the uses of that system must be studied first; more specifically, the uses of a cost accounting system.

The Uses of Accounting:

The accounting system of any entity must provide records and reports to meet three distinct groups of needs:

1. Legal. All organizations are subject to many statutory, administrative, and common-law requirements which cumulatively place considerable constraint upon the nature and content of records, and the nature, frequency, and content of reports.

2. Stewardship. Many groups and individuals external to the day-to-day operations of the organization have a valid need for information sufficient to evaluate the performance of the management

group.

3. Managerial. The managers of an organization or a subset of an organization need information at a time and in a form which will enable them to perform their functions efficiently and effectively and exercise proper control on the operations.

It is in this third group that we are principally interested in as far as the management of the Public Works Department of Fulton County.

The Management Control Process:

In order for an economic enterprise to operate profitably and efficiently, it is necessary to exercise control at the various stages of the operation. The managerial processes which concern cost accounting most directly are those which center on planning for the future and controlling current operations. These may be characterized broadly as processes of management control utilizing four separate though interrelated techniques. These are described below:

1. Control through Planning: Control always begins at the planning stage. No other technique controls the destiny of the enterprise as does planning.

Planning is the process of deciding on a course of action, of finding the alternatives available and choosing from among them. It takes three forms: (1) policy formulation - establishment of the major ground rules that determine the basic direction and shape of the enterprise; (2) decision making - the choice among alternative solutions to specific problems within the prescribed policy limits; and (3) budgeting - the preparation of comprehensive operating and

financial plans for specific intervals of time.

All of these are decision processes and all are subject to replanning as conditions change, better information becomes available, or the goals of the enterprise are revised. These decisions may be on a large scale and deal with basic strategies or small in scope and concern only minor questions of operating tactics. However, they are all alike in depending on comparisons of the expected or planned costs to the benefits of the various perceived alternatives.

2. Control through Direction and Supervision: The second control mechanism consists of the interrelated processes of direction, coordination, and supervision. These are the means by which work is executed as planned and expenditures are kept consistent with the established plans. It requires a capacity to anticipate potential trouble spots and to take action before trouble arises. It also presumes an ability to see when things are going wrong, without waiting for the more formal indications provided by specifically designed feedback linkages, and in this it shades imperceptibly into the third control process.

3. Control by Feedback Response: The third link in the chain of control techniques is responsive control, the actions taken on the basis of the observation and analysis of performance. Routine reports, for example, are attention directing in that they emphasize deviations from plans and signal the presence of conditions or problems that should be investigated.

Responses to feedback data are of two types: corrective and adaptive. The response should be a corrective action if direct

control has been inadequate, and an adaptive action if the deviation was due to an inhospitable environment and some form of replanning is required.

4. Control by Appraisal: The feedback mechanism serves another purpose--that of performance appraisal. This has a threefold effect. First, the gap between actual and satisfactory performance helps management distribute rewards and penalties among its subordinates. This would inevitably affect the motivation of the affected personnel, hopefully in a positive direction.

Second, a soundly based appraisal system will lead to the promotion of the more effective managers to positions of greater scope and responsibility.

Third, the mere presence of an appraisal system can have a salutary effect on performance. People often behave differently--sometimes better, sometimes worse--if they know that their performance is being monitored. Acceptance of the appraisal system is likely to improve performance, and management's task is to secure this acceptance.

In order to exercise all of the above types of controls, a detailed analysis of cost accounting data becomes necessary. Usually this analysis is done in most organizations which deal with any fair size of money, the Public Works Department of Fulton County also being one of them. However, in order to have effectiveness in the second and third types of controls--control through direction and supervision and also control by corrective response--the timing of information availability is important. The sooner the information can be made available after the cost has occurred, the better is the control

process. The timing factor is dealt with in greater detail later in this report.

Where does Cost Accounting fit in:

Cost accounting is a special aspect of the accounting process. It can be defined as the body of concepts, methods, and procedures used to measure, analyze, or estimate the costs, profitability, and performance of individual jobs, departments, and other segments of a company's operations, for either internal or external use or both, and to report on these questions to the interested parties.

A cost accounting department would typically be concerned with four activities.

1. Cost finding: Measurement or estimation of the costs of individual jobs, departments, or other segments of the firm's operation.
2. Cost analysis: Estimation of the relationships between costs and various determinants of costs.
3. Cost recording: Classification and distribution of costs.
4. Cost reporting: Communication of cost data to various interested parties.

Once the costs are received, necessary planning and control actions can be taken on the basis of these costs.

Cost Accounting in the Public Works Department

Having examined the applications and advantages of cost accounting, let us now see how these would affect the Public Works Department of Fulton County.

Present Costing Procedures:

The current costing procedures start with the issuing of the Work Order (Exhibit A). Each work order has a number unique to itself and contains information as to location and description of work, an estimate of quantities of material requirements and an estimate of cost under the headings of salaries, convict, equipment, materials, engineering, overhead and total, each broken down for various operations. The work order is the basis for all construction work undertaken by the Public Works Department.

Each day's construction activities are reported on the Public Works Daily Work Report (Exhibit B), a separate page used for each project that is worked on. These reports are routed daily to the prison clerk in the Bellwood Camp where they are filed. Periodically (not always daily) the Monthly Work Project Report (Exhibit C) is filled up, one for each project, with information derived from the "Daily Work Reports." This monthly report is a worksheet used for tabulating information from the daily work reports. Once completed, the daily information on the report is totalled to obtain monthly figures. These figures are then transferred to the Work Project Report Monthly Summary (Exhibit D) sheet (one sheet for each project worked on during the month). The information transferred is the number of days various employees worked on the project, number of days for which various equipment were used on the project, and the quantities of different raw materials used. It is this report that is sent to the Division Engineer (Administrative Division) once a month. All of the above work is done manually at the Bellwood Camp.

The Division Engineer receives the "Work Project Report Monthly Summary" once each month, one report for each project worked on during the previous month. On these reports he adds the rate (number of units) for each piece of equipment used (from Exhibit E) and the rate (a cost figure) for the various materials. He also multiplies the days for which each equipment was used by the rate to get the total number of units for which each equipment should be charged against a given project. This is summed for all the equipment.

These reports are then arranged manually in a preset sequence and sent to the data processing department for "feeding" into the computer. The output from the computer (job 50) lists the projects in groups depending on the actual activities and their locations. The report lists the "total expense" for each project for that month and a breakdown of this figure. A "total direct" cost is given which is the sum of "salaries," "convict expenses," "equipment," and "supplies." Values of 5% of the total direct cost are taken as the "engineering cost" and the "overhead." The "total expense" for the project is the sum of the total direct, engineering cost and overhead, i.e., 110% of total direct cost. Copies of this report are sent to 1) Finance Department, 2) Director of Public Works and 3) Division Engineer (Administrative Division), Public Works. The Director uses his copy to review construction costs. The Division Engineer uses his copy to charge off work done by the Public Works Department for the other departments of Fulton County. The use by the Finance Department could not be determined.

In addition to job 50, another output (job 51) is printed by the

computer every month. This shows the estimated cost for a given job, the expenses incurred to date including the month for which the report is made and the balance remaining. The cost figures are given for the various headings shown on the Work Order. If the job is a carry-over from the previous year, the prior year's summary is also given. One copy of this report is received in the Public Works Department and is used by various individuals as necessary.

Uses of the Daily Work Report:

The principal use of the daily work report is for the preparation of the work project report monthly summary as described above. However, it is also being used for two other purposes.

1. The camp clerks at Stonewall and Alpharetta use these reports for completing work attendance records in the payroll books for their camps. These records are used for preparing payrolls. This is done on a daily basis.

2. At the Bellwood Camp, a clerk (an inmate at the Camp) uses these reports from all three camps and prepares attendance records in the payroll book for each Camp. This is done on a daily basis.

3. The inmate at the Bellwood Camp also uses the Daily Work Reports to prepare a "Daily Construction Report."

The Daily Work Reports are filed at the Bellwood Camp and are stored in the basement.

Problems and Drawbacks with the Present System:

The biggest problem appears to be the timing factor. The work crew foremen complete the work report daily. This is approved by the Area Maintenance Supervisor (a careful examination of the reports revealed that they are only being initialled instead of being carefully

reviewed) and sent to the Bellwood Camp such that each day's work reports arrive there the next morning. The primary delay occurs here at the Camp. According to the present system, reports are held there for a full month before being summarized. On several occasions, delays of more than a month also occur. This is primarily caused due to the fact that periodically the inmate working on these reports leaves the Camp and has to be replaced by a new inmate. The very fact that an inmate is used for this job (which requires some basic training) appears wrong. Not only are retraining efforts required each time a new person is brought in (this slows down the work which gets into a backlog), but the inmate who is assigned the job, no matter how sincere, knows that he will soon leave and will not be responsible. As a result, a serious attitude towards the work will never develop in most cases. Another drawback appears when the inmate assigned to the work leaves the Camp. He has to be replaced by another inmate even if the new inmate does not have the basic qualifications and aptitude to do the job. As a result, it may take a fairly long training time as well as errors can occur. The way the present system is set up, there is no check on the work of the inmate and so, if any errors have been committed, they usually go undetected. If an inmate is found making excessive errors or not meeting schedules, disciplinary action cannot be taken against him. At the most he can be replaced by another inmate.

Another major drawback appears in the way the equipment is charged off. Each piece of equipment is assigned a rate in number of units on a scale of 0 to 11 (Exhibit E). This rate is updated once

in several years. Besides, all equipment of the same type have the same rating and hence the same charge-off cost per day. There is no factor built in for newer equipment which may have to be depreciated heavily in the first few years and for older equipment which may need excessive repair and maintenance costs to keep it in working condition.

The equipment charge-off rate in dollars per unit (Exhibit F) is also updated once a year and is based on the budgeted expenses for the current year, the total number of units representing all the equipment and the average number of working days per year. The following procedure is used for computing the unit rate (the figures shown are for 1974).

Avg. work days/year x equipment units = 88,220 unit-days/year

Total 1974 budget for equipment repairs and maintenance = $1,234,197

$$1974 \text{ equipment rate} = \frac{\$1,234,197}{88,220} = \$14.00/\text{unit}.$$

The drawbacks with this procedure are: (i) The budgeted expenses are used. Should the actual expenses vary from the budgeted, there is no provision for charging this difference to the jobs. At the end of the current year, the new budget figures are used. It may be argued that the new budget is based on actual expenses in the previous year. However, it should be kept in mind that proposed budgets seldom equal the approved budgets. (ii) All the pieces of equipment are not used for each of the working days in the year, although this is the assumption made in computing the unit rate. However, projects are charged for equipment on the basis of actual number of days used. The number of days for which an equipment may not be used is not charged anywhere.

When charging off costs of employees such as foremen, equipment operators, etc., an average daily salary is used for each category of employee. These figures are updated each time a general raise is awarded by the same percentage as the raise. Since records are being kept on the actual individuals who are working on a specific project each day, there is no reason why the actual salaries of these individuals cannot be charged to the projects instead of using an average salary figure.

The work done by the inmate at the Bellwood Camp, as described earlier, is strictly of a tabulating nature. Adding the "rates" to the "Work Project Report Monthly Summary" by the Division Engineer is also work of the same nature. Unnecessary time is used as well as chances of errors occur due to fatigue and monotony. There is no reason why this work cannot be put on the computer.

In each Camp, time cards are maintained for all the employees in that Camp. Every employee punches "in" and "out" each day he works. In addition to this attendance record, the "Daily Work Reports" are used as described earlier for maintaining attendance records at each Camp. There appears to be no need for triplication of attendance records for Alpharetta and Stonewall Camps and duplication of records for the Bellwood Camp. The time cards can easily be used for payroll purposes thus avoiding this duplication and triplication.

According to the present set-up, on an average it takes nearly four weeks before one can get to see the actual cost figures in the computer print outs of jobs 50 and 51. This period is further extended on occasions. For instance, jobs 50 and 51 for January 1974

have come out as late as the first week of June, a delay of over four months. This delayed information cannot be used for control purposes; the very purpose of a cost accounting system is thereby defeated.

Areas for Cost Control in the Public Works Department

A close examination of the activities of the Public Works Department reveals that cost control can be exercised in the following areas:

1. New construction work done by the County.
2. Maintenance work done by the County (roads, sewers, bridges, water, etc.).

These areas cover most of the work done by the Public Works Department and are examined in detail below.

New Construction Work:

This covers all construction work undertaken by the County. It is done by issuing a work order for work activity which is new or requires considerable capital investment. The expenses for new construction can be divided into several headings:

1. Cost of planning and design.
2. Cost of construction materials and supplies.
3. Cost of direct labor.
4. Cost of indirect (supervisory & inspection) personnel.
5. Cost of construction equipment.

1. Cost of Planning and Design: This includes costs of salaries, overheads and office and drafting supplies. Records can be maintained by each individual involved in a specific project as to the time he spends working on the project. This, multiplied by the salary

(including cost of fringe benefits) of the individual, will account for the cost of his involvement in the project. An overhead rate could be applied as a percent of the cost of individuals directly involved in the planning and design work. The cost of general supplies can be included in the overhead. However, the cost of any special supplies, duplicating, printing, etc. must be kept track of and charged to the specific project.

2. Cost of Construction Materials and Supplies: This includes the cost of materials and supplies used for the project. As material is issued, whether from a stockpile or from material received for that project, it should be noted and charged against the project. The progress made (length of road, cubic yards of concrete work completed, etc.) can then be evaluated with the amount of material consumed.

3. Cost of Direct Labor: Records should be kept on the time that each individual spends on the project. The time spent by the individual multiplied by his hourly rate (adjusted for the cost of fringe benefits) will result in the cost of direct labor. However, since free convict labor is used as a part of the work force, and the Public Works Department is responsible for all expenses incurred on them, periodically a cost per convict per day should be computed and this figure should be used to determine the cost of convict labor.

4. Cost of Indirect Personnel: The indirect personnel would include those individuals who are involved in the supervising and inspection of construction projects but are not directly associated with any given construction crew. During any given time period (which may be a day or a week) these individuals may allocate their time to

several projects. Records should be kept as to the actual time one spends on each of the projects. Since the time spent in travelling also has to be accounted for and the individual may travel from one project to the next (instead of to the office and then to the second project), one method of allocating travel time could be to count the travel time to travel to a project (from the previous place) against that project. The time can then be converted to a cost figure in the same way as for planning personnel.

5. Cost of Construction Equipment: The allocation of equipment cost in the heavy construction industry (includes pipelines, highways, bridges, excavation of dirt and rock, etc.) has always been a controversial issue and has been handled in many different ways.

Equipment cost is composed of two basic components: (1) ownership cost and (2) operating cost. The ownership cost includes depreciation of the original purchase price, property taxes, insurance, interest, storage and administration. If the equipment is rented, this ownership cost is equivalent to the rental cost. The operating cost includes fuel and lubricants, expendable supplies, repair costs, operator wages, mechanic wages, tires, and other direct costs related to the actual use of the equipment. It would also include equipment transferring costs. Scheduled maintenance costs could be included in either category, preferably the latter.

Inevitably, the allocation of equipment cost to specific work orders must involve the use of some type of standard cost, such as a rate per hour, day or week. In the Public Works Department this is done by using a fixed cost per day per unit, and each equipment is

assigned a specific number of units depending on the ownership and operating costs per year and the average number of days the equipment is used in one year (Exhibits E and F). However, the unit cost assigned to a specific piece of equipment is updated once a year although the actual costs may change rapidly during this period. The number of units assigned to a specific equipment is usually not changed for several years.

Maintenance Work:

The maintenance work done by the Public Works Department of Fulton County is executed in either of two ways:

(a) by blanket work orders issued to cover repetitive work. These are generally issued once a year to cover the entire year's activity, but may be issued more often, and

(b) by maintenance work orders issued to cover repair and maintenance of existing facilities on a project basis.

The maintenance work can be divided into the following headings:

1. Cost of construction materials and supplies.
2. Cost of direct labor.
3. Cost of indirect personnel.
4. Cost of construction equipment.

Each of the above four elements of cost can be computed as explained above under new construction work.

A New Cost Accounting System

A study of the present system for keeping track of construction and maintenance costs reveals that a cost accounting system already exists in the Public Works Department. It does, however,

have many drawbacks some of which have been discussed in an earlier section. In order to alleviate these drawbacks and make it an efficient cost accounting system a major overhaul of the present system is necessary. Only then can the full benefits of a cost accounting system be derived.

The Proposed System:

To begin with, the very basis of the system--the "Daily Work Report" should not undergo a major change. It is the opinion of the researcher that such a change in this form could cause unnecessary suspicion and ill-feelings amongst the people at the lowest level in the organization. It must be kept in mind that the output from any system is as good as the input. Hence it is absolutely necessary to obtain the full cooperation of the people responsible for filling in the Daily Work Report. At this stage it appears that the only additional information that may be required in this report is the employee number and the equipment number. This will identify the exact individuals and equipment that were used. The format of the form may have to be changed to make it easier to input the information into the computer.

The daily work report should be completed by the crew foreman as is being done at the present. However, stress should be given on completing the form in its entirety. It has been observed that many of these forms are not being filled in completely. Besides many of them are found to have wrong work order numbers.

At the end of the work day, each one of these forms should be turned in to the Area Maintenance Supervisor for that Camp. It should

be his duty to review each one carefully before initialling them so as to ensure their accuracy. It has been found that inspite of a memo dated 3-4-74 from Mr. Wood to Messrs. Loyd, Garmon, Houston and Austin asking them to carefully review and complete all forms, errors and missing information were found on some of the "daily work reports." These reports must be complete and accurate when they leave the Area Maintenance Supervisor's desk.

The daily work reports from each of the three camps should be sent to the main office (downtown) the following day. Once at the main office, the information should be put into the data processing system within a pre-determined time (twenty-four hours could be suitable). This can be done either by means of punched cards or an on-line teletype or CRT terminal. By following this procedure the files are updated once every twenty-four hours and information contained in them is never more than two days old.

The system should be set up in such a way that it can be interrogated through a remote terminal to find out various kinds of information such as cost on a project to-date, amount of estimated funds remaining against a project, cost incurred against various headings such as salaries, equipment, engineering, etc., percent of order completed, and any other questions that may be found necessary for effective control.

When designing a new cost accounting system, some changes should be incorporated into the present costing procedures. These are described below:

1. As suggested earlier, time records should be kept by each

individual in the Office Engineering Division so that the engineering costs can be actually determined for each project instead of taking a flat 5 percent.

2. The overhead costs should be computed in the same way as is being done at present. The percent figure used, should be updated at least once a year.

3. The rates used for charging off construction employees should not be taken as average figures. Exact salaries (including fringe benefits) of individuals working on specific projects should be used.

4. When charging off equipment, the number of units assigned to a piece of equipment should not necessarily be the same for all other similar equipment. Each piece should be assigned its own unit rating taking into consideration factors such as depreciation for the year, expected maintenance costs, transportation costs, tires, fuel consumption, etc. This figure can be updated once a year. The cost per unit per day should be computed taking into account the expected number of days that each equipment is to be used for. This cost per unit can be kept the same for all equipment.

5. The inmate cost is based on the budget for the current year and there is no allowance made for adjustment during the year should the actual costs go higher. It may be desirable to adjust these rates after the first six months by some formula which would take into consideration the budgeted amount and the actual costs in the first six months.

Benefits from the Cost Accounting System:

To justify its existence, a cost accounting system must be capable

of providing management with the types of information necessary to make timely, rational and informed decisions. The benefits from a well-designed cost accounting system can be categorized into quantitative factors and qualitative factors.

Among the quantitative factors, one of the greatest advantages from an accurate cost accounting system is that of charging other departments for jobs done for them by the Public Works Department. Another advantage is the availability of accurate unit cost figures (which are updated periodically so as to remain current) for various types of construction and maintenance work done. These are very useful for predicting and basing future estimates upon.

The most important of all the qualitative factors is that a properly organized cost accounting system provides an effective means of controlling operations and of appraising organizational functions and activities. Detailed comparisons are also made possible between budgeted and actual results or between estimates and actual quantities of labor and materials used. Besides, budgets and performance reports have an impact on motivation of employees toward organizational goals.

A well designed cost accounting system serves as a vital source of data for management planning. The accounts and document files are a repository of a vast quantity of details about the past progress of the organization, without which forecasts of the future can scarcely be made.

Conclusion

In this study the feasibility of having a cost accounting system in the Public Works Department of Fulton County has been looked at. The existing reporting and costing procedures have been reviewed in detail. This has revealed that a cost accounting system already exists but there is considerable room for improvement. Many of the problems and drawbacks of the present system have been noted. A new system has been proposed which should assist in bringing out the full usefulness of the cost accounting system.

There are two major changes that have been proposed. First, suggestions have been made to change certain accounting procedures. These changes will increase the accuracy of the cost information available. Second, it has been recommended to put the information into the data processing system at the very beginning. This will help eliminate most of the clerical work which is essentially tabulating and transferring of information from one form to another. This, when done manually, causes unnecessary delays and increases the chance of errors.

When introducing the proposed system it should be remembered that it has been assumed that the data processing system has high reliability, infrequent breakdowns and does not work from a large backlog. Only then can information in the cost accounting system be kept current and available whenever required.

It should also be emphasized that the availability of very current information or performance reports are by themselves not the control device. Control is accomplished by direct action, and all the

reports in the world won't bring a deteriorating situation back under control unless they trigger some sort of action. A good cost accounting system will only improve the quality of the information available to management. This will increase management's confidence that its actions are the right ones.

EXHIBIT A

(A typical Work Order)

49-109-372

FULTON COUNTY DEPT. PUBLIC WORKS

WORK ORDER

December 18, 1973
Date

RC3-62S
Work Order No.
(REVISED)*

To: Superintendent of Construction

Proceed with the following project:

Location: West Stubbs Rd. (Cascade-Palmetto Hwy. to Butner Rd. - 9,550')

Description of Work: Grading, T.S.T. Paving
(26' roadway width, no curbing, with 3" crown, T.S.T.)

ESTIMATE OF MATERIALS

Grading & General Drainage	24,900 Gal. Liquid Asphal
6,300 Tons Crusher Run(@ 5"-Base)	
690 Tons #M5 Stone (50#/yd^2)	
165 Tons #7 Stone (12#/yd^2)	
165 Tons #89 Stone (12#/yd^2)	

ESTIMATE OF COST

Operation	Salaries	Convict	Equip.	Materials	Engr.	OH	Total
Grading/Drainage	17,974	3,784	20,812	10,000	2,365	2,365	57,300
Base	4,471	2,980	2,484	12,420	1,242	1,242	24,839
#M5 Stone	584	390	324	1,620	161	161	3,240
#7 Stone	140	94	78	390	39	39	780
#89 Stone	140	94	78	390	39	39	780
Prime/Asphalt	1,105	604	1,105	6,230	503	503	10,050
Totals	24,414	7,946	24,881	31,050	4,349	4,349	

Estimated Total Cost $ 96,989.00

Remarks:

*NOTE: REVISION OF W.O. # RC3-62S PREVIOUSLY DATED 12/4/73.

Distribution:

Office	(✓)
County Manager	( )
Bellwood	( )
Stonewall	( )
Comptrolier	( )
Mr. McDonald	( )
Alpharetta	( )
Other	( )
Data Proc.	( )

A. T. McDonald, Director

EXHIBIT B (FRONT)

PUBLIC WORKS DAILY WORK REPORT
FULTON COUNTY, GA.

CAMP _____ DATE _____ 19____

REPORT BY _____ LOCATION _____

HOURS – From _____ To _____ WORK ORDER # _____

TYPE WORK: ☐ Base ☐ Paving ☐ Grading ☐ Drainage ☐ Sewer ☐ Curbing ☐ Water ☐ Other _____

DESCRIPTION OF WORK COMPLETED TODAY _____

NO. LOADS HAULED _____ CURBING SET _____ YDS. DIRT MOVED _____

EMPLOYEES	NO.	EMPLOYEES	NO.	EMPLOYEES	NO.
WARDEN		Equipment Operator I		Guard, Day	
Bldg. Const. Foreman		Equipment Operator II		Guard, Night	
Constr. Foreman		Equipment Operator III		Utility Guard, Day	
Foreman – Grade				Utility Guard, Night	
– Water		Utility Operator I		Extra Guard, Day	
– Sewer		Utility Operator II		Extra Guard, Night	
– Paint				Stewart Guard	
– Laundry		FIELD MECHANIC		CLERK	
EQUIPMENT	**NO.**	**EQUIPMENT**	**NO.**	**EQUIPMENT**	**NO.**
Air Compressor		Crane – Truck Mounted		Trenching Machine	
Asphalt Distributor		– Crawler		Truck – Pickup	
Asphalt Spreader		Car, Passenger		– 3 & 5 Yd.	
Backhoe – Sm. Rubber Tire		Forklift		– 10 Yd.	
– Lg. Rubber Tire		Frontend Loader – Rubber Tire		– Striping Truck	
– Tractor Mounted		– Dozer Type		– Grease Truck	
– Lg. Crawler		EARTH MOVER 8 YD.		– Squad	
Bulldozer – D-6 & D-7		EARTH MOVER 15 YD.		– Tractor/Trailer	
– D-8 & D-9		Roller – Hand Roller			
Bus		– Small (3 & 5 ton)		Tractor – Grass	
Chipper		– Lg. (6 tons & over)		– Dozer Type	
		MOTOR GRADER			

MATERIALS		QUANTITY	MATERIALS		QUANTITY
Asphalt – Binder	(tons)		Pipe – 18" Metal	(Feet)	
– Top	(tons)		– 24" Metal	(Feet)	
– Tack	(gals)		– Metal	(Feet)	
Brick	(Each)		– 8" Cast Iron	(Feet)	
Block	(Each)				
Cement	(Bags)				
Concrete	(Cu Yd)		Sand	(Tons)	
Pipe – 18" Concrete	(Feet)		Stone – Crusher Run	(Tons)	
– 24" Concrete	(Feet)		–	(Tons)	
Concrete	(Feet		–	(Tons)	
INMATES					

NOTE

This report must be filed each day on each project – only report one project on a sheet. Please be neat and accurate.

EXHIBIT B (BACK)

LIST BELOW NAME OF EACH MAN EMPLOYED ON THIS PROJECT TODAY. SHOW HIS PROPER TITLE AND NUMBER OF HOURS EMPLOYED.

NAME OF EMPLOYEE	TITLE	HOURS WORKED	EQUIPMENT COUNTY NUMBER

NOTICE: TRUCK DRIVER MUST REPORT LOADS HAULED

EXHIBIT C

EMPLOYEES	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	SUB	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	SUB	TOTAL
Deputy Warden																																		
Bldg. Constr. Foreman																																		
Constr. Foreman																																		
Foreman – Grade																																		
– Water																																		
– Sewer																																		
– Paint																																		
– Laundry																																		
Equipment Operator I																																		
Equipment Operator II																																		
Equipment Operator III																																		
Utility Operator I																																		
Utility Operator II																																		
Guard, Day																																		
Guard, Night																																		
Utility Guard, Day																																		
Utility Guard, Night																																		
Extra Guard, Day																																		
Extra Guard, Night																																		

EQUIPMENT	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	SUB	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	SUB	TOTAL
Air Compressor																																		
Asphalt Distributor																																		
Asphalt Spreader																																		
Backhoe – Sm., Rubber Tire																																		
– Lg., Rubber Tire																																		
– Tractor Mounted																																		
– Lg. Crawler																																		
Bulldozer – D-6 & D-7																																		
– D-8 & D-9																																		
Bus																																		
Chipper																																		
Crane – Truck Mounted																																		
– Crawler																																		
Car, Passenger																																		
Forklift																																		
Frontend Loader – Rubber Tire																																		
– Dozer Type																																		
Motor Grader																																		
Pan & Tractor																																		
Roller – Hand Roller																																		
– Small (3 & 5 ton)																																		
– Lg. (6 ton & over)																																		
Trenching Machine																																		
Truck – Pickup																																		
– 3 & 5 Yd.																																		
– 10 Yd.																																		
– Striping Truck																																		
– Grease Truck																																		
– Squad																																		
– Tractor/Trailer																																		
Tractor – Grass																																		
– Dozer Type																																		

MATERIALS	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	SUB	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	SUB	TOTAL
Asphalt – Binder, Tons																																		
– Topping, Tons																																		
– Tack, Gals.																																		
Brick – Each																																		
Cement – Bags																																		
Concrete – Cu. Yd.																																		
Pipe – 18" Concrete, Feet																																		
– 24" Concrete, Feet																																		
Concrete, Feet																																		
– 18" Metal Feet																																		
– 24" Metal Feet																																		
Metal Feet																																		
– 8" Cast Iron Feet																																		
Feet																																		
Sand, Feet																																		
Stone, Crusher Run Feet																																		

INMATES																																		

WORK PROJECT REPORT

PUBLIC WORKS DEPT.

FULTON COUNTY, GEORGIA

CAMP _____ MONTH _____ 19____

PROJECT _____ WORK ORDER # _____

EXHIBIT D

WORK PROJECT REPORT MONTHLY SUMMARY

PUBLIC WORKS DEPARTMENT

FULTON COUNTY, GEORGIA

EMPLOYEES	DAYS	RATE
Bldg. Constr. Foreman		13
Constr. Foreman		12
Foreman		
Equipment Operator I		8
Equipment Operator II		9
Equipment Operator III		10
Utility Operator I		6
Utility Operator II		4

CAMP _____

DATE _____

EQUIPMENT	DAYS	RATE	
Asphalt Distributor			
Asphalt Spreader			
Backhoe			
Bulldozer			
Crane			
Front End Loader			
Motor Grader			
Pan & Tractor			
Roller			
Trenching Machine			
Truck – Pick Up			
– 3 & 5 Yd.			
– 10 Yd.			
–			
Tractor – Grass			
– Dozer Type			

EQUIPMENT TOTAL _____

MATERIALS		QUANTITY	RATE
Asphalt – Binder	Tons		
– Topping	Tons		
– Tack	Gals.		
Brick	Each		
Cement	Bags		
Concrete	Cu. Yd.		
Pipe – 18" Concrete	Feet		
– 24" Concrete	Feet		
Concrete	Feet		
– 18" Metal	Feet		
Metal	Feet		
Metal	Feet		
– 8" Cast Iron	Feet		
Sand	Tons		
Stone – Crushed Runs	Tons		

PROJECT _____

W. O. # _____

DESCRIPTION _____

EXHIBIT E

EQUIPMENT RATING FACTORS
1974

EQUIPMENT	UNITS
Air Vibrator	½
Air Compressor	3
Asphalt Distributor	4
Backhoe	8
Bantam Crane	6
Boring Machine	1
Broom	1
Bulldozer (Crawler)	8
Bus	3
Bush Hog	2
Chain Saw	½
Chipper	2
Crane	8
Dragline	8
DW	11
Ditcher (Trencher	7
Forklift	2
Front End Loader (Earth Mower	7
Grader	8
Grease Unit	2
Harrow	½
Mixer (Cement)	1
Mower (Tractor Mounted	2
Pan & Tractor	8
Pump	½
Pusher (Tractor)	8
Rock Spreader	4
Roller	4
Sewer Cleaning Machine	1
Sheepsfoot Roller	1
Spreader Asphalt	6
Station Wagon	1
Tractor:	
D-6, D-7, D-8	5
Trucks:	
Pickup	1
3 Yard	3
5 Yard	4
10, 12 Yard	6
Flatbed and Grease Truck	3
Squad Truck	3
Trailer	1
Water Transport	3
Tractor & Trailor	5
Striping Truck	4

EXHIBIT F

EQUIPMENT RATES

	1973 Budget	1974 BUDGET
Salaries	$ 150,210	$ 169,078
Social Security, Insurance, Pension	*	25,716
Inmates (250 days x 14)	47,950	59,395
Equipment Rental	3,200	1,252
Telephone	**	1,800
Heat, Lights, Water	5,000	10,000
Diesel Fuel	22,000	41,185
Gasoline	67,000	124,900
Kerosene	2,500	5,529
Lubricants	6,000	14,636
Tires	40,000	57,631
Heavy Equipment Repairs	110,000	162,327
Auto & Truck Expense	65,000	77,888
Equipment Inventory	316,000	482,860
	$ 834,860	$1,234,197

* Not included in 1973 Budget
** Not included in 1973 Equipment Charge-outs.

Average work days/year x equipment units = 88,220 unit-day/year.

	1973 Equip. Rate	1974 Equip. Rate
Cost Per Day	$ 9.46/unit	$ 14.00/unit
Cost Per Hour	1.18	1.75